

CLAIMS

1. A method of measuring renal function in a living subject using computed tomography comprising the steps of:

5 a) obtaining a CT number (CT_{PRE}) of arterial blood prior to addition of a radiographic contrast agent to the blood,

b) providing a radiographic contrast agent to the blood,

c) obtaining a CT number (CT_A) of arterial blood after addition of the radiographic contrast agent to the blood,

10 d) obtaining a CT number (CT_V) of blood in a renal vein after addition of the agent to the blood, and

e) determining renal function from the obtained CT numbers.

2. The method as defined by claim 1 wherein the renal function is renal extraction
15 fraction.

3. The method as defined by claim 2 wherein renal extraction fraction (EF) is given by:

$$EF = \frac{CT_A - CT_V}{CT_A - CT_{PRE}}$$

20 4. The method as defined by claim 3 wherein step b) includes providing iohexol.

5. The method as defined by claim 3 wherein step b) includes providing iothalamate.

6. The method as defined by claim 3 wherein step b) includes providing gadolinium-
25 DTPA.

7. The method as defined by claim 1 wherein step b) includes providing iohexol.

8. The method as defined by claim 1 wherein step b) includes providing iothalamate.

30 9. The method as defined by claim 1 wherein step b) includes providing gadolinium-DTPA.

10. A method of determining renal extraction fraction (EF) for a kidney in a living subject comprising the steps of:

a) obtaining a measure of x-ray transmission through arterial blood prior to addition of a radiographic contrast agent to the blood,

b) obtaining a measure of x-ray transmission through arterial blood after addition of the radiographic contrast agent to the blood,

c) obtaining a measure of x-ray transmission through renal vein blood after addition of the radiographic contrast agent to the blood, and

d) determining renal extraction fraction from the measures of x-ray transmission in steps a), and b), and c).

11. The method as defined by claim 10 wherein the measures of x-ray transmission are obtained using computed tomography (CT).

12. The method as defined by claim 11 wherein the measures of x-ray transmission are CT numbers.

13. The method as defined by claim 11 wherein the radiographic contrast agent is selected from the group consisting of iohexol, iothalamate, and gadolinium-DTPA.

14. The method as defined by claim 10 wherein the radiographic contrast agent is selected from the group consisting of iohexol and iothalamate.